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GB A	2133686	GB	0258437
GB A	2133676	GB	0197383
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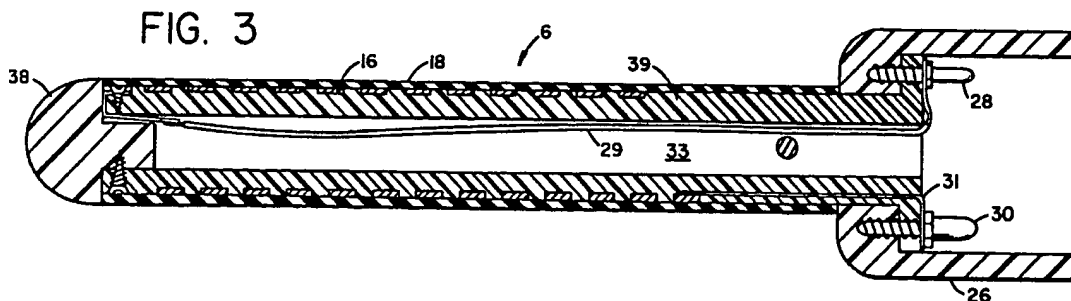
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(54) **Hair curling implement**

(57) A hair curling implement constructed with a high efficiency heating system and a soft outer surface for contact with the hair. The hair curling implement, i.e., the heated curling iron and heated curling brush has an elongated tubular member around which hair of the user can be wrapped and a handle that is coupled to the elongated member. A flat resistance heating wire is wrapped in a spiral pattern around the elongated tubular member and an electrically non-conductive sleeve is positioned over and in contact with the flat resistance heating wire on the elongated member. Heat generated by the heating element is readily transferred to the hair without the flat resistance heating element coming into contact with the hair.



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FIG. 1

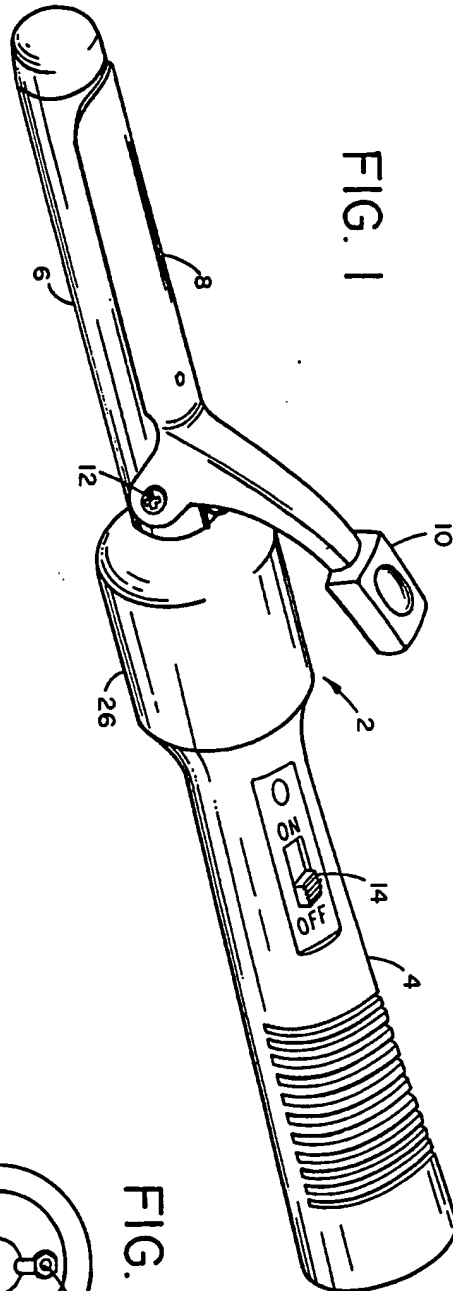


FIG. 4

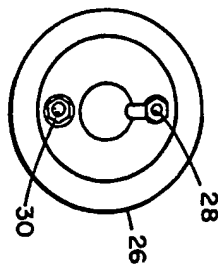


FIG. 2

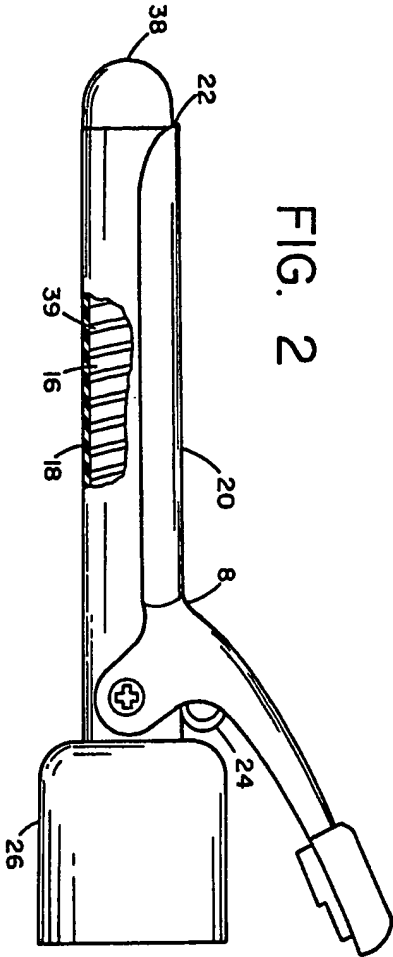
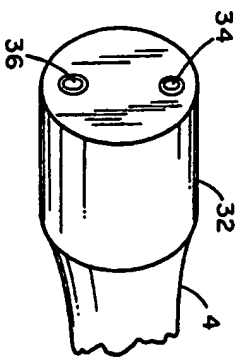


FIG. 5



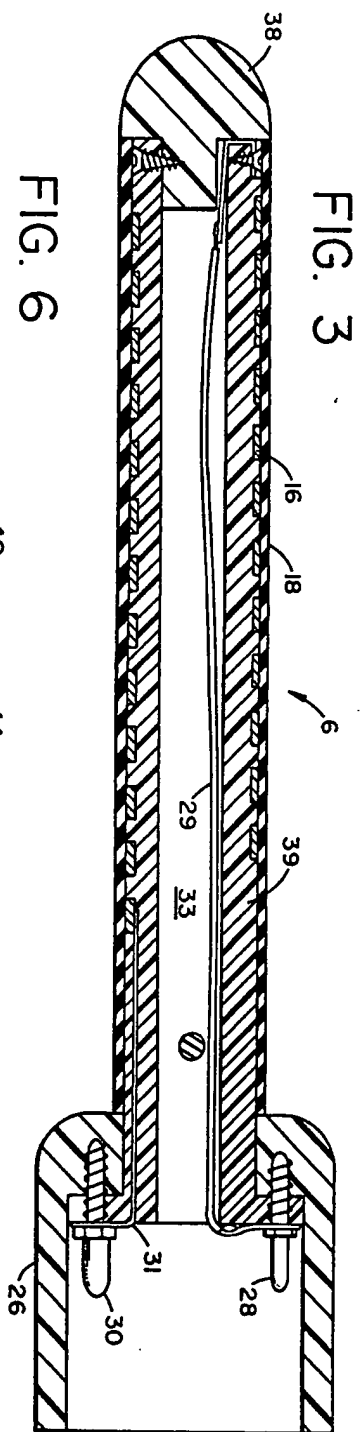


FIG. 3

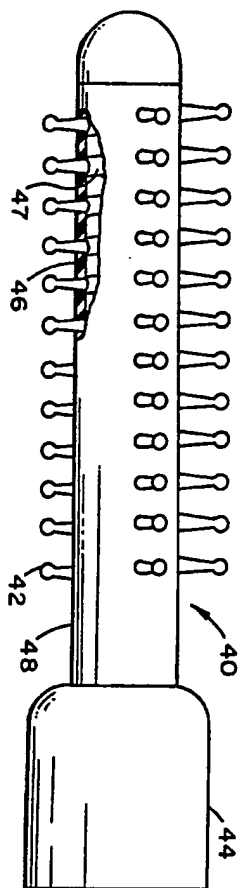


FIG. 6

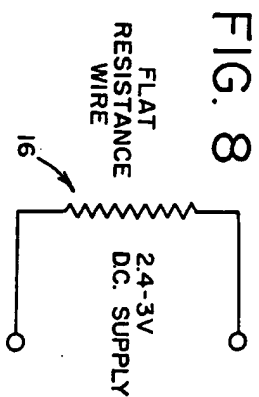


FIG. 8

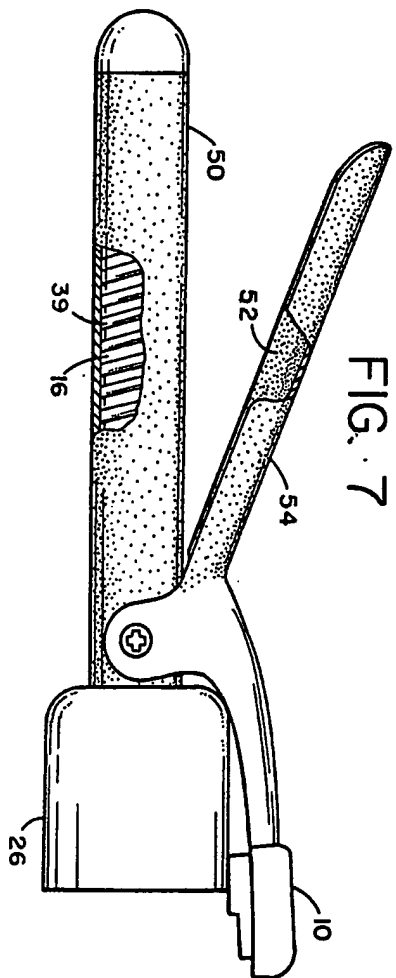


FIG. 7

FIG. 9

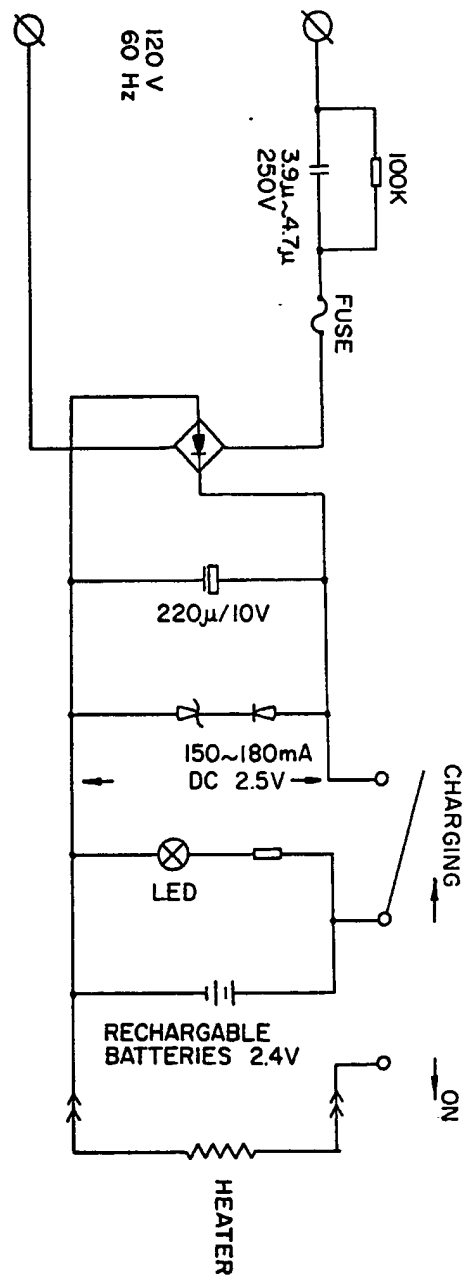
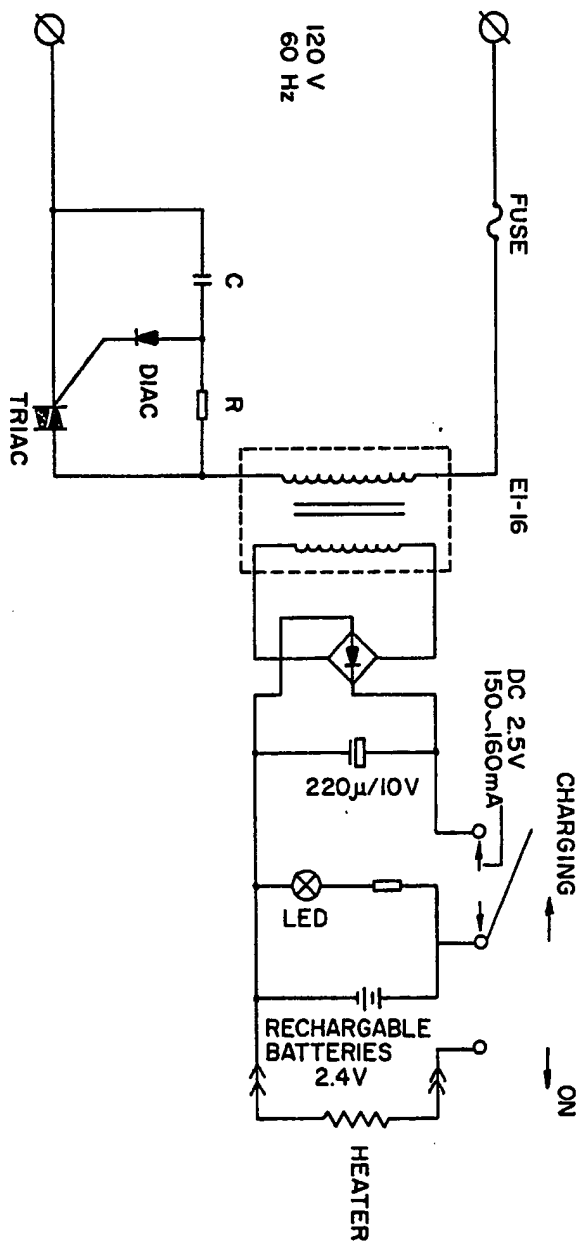


FIG. 10



## SPECIFICATION

## Hair Curling Implement with High Efficiency Heating System

The present invention relates to a hair curling implement, in particular a heated curling iron and a heated curling brush for applying heat for use in styling the hair of a user of the implement.

Over the past several years, extensive efforts have been made to improve the various hair curling irons and hair curling brushes that are used with the application of heat for styling of hair. Typically, these curling irons and curling brushes have used metal barrels that are heated by a resistance member that extends longitudinally within the barrel. The heating member, which is a resistance wire to which an electrical current is applied, generates heat which is then transmitted to the metal barrel and in turn transferred to the hair of the user. While a significantly high level of heat must be applied to the hair, preferably of the order of approximately 150°C, the contact of the metal barrel with the hair occasionally can cause damage to the hair. Consequently, various efforts have been made for providing a soft surface on the outer surface of the barrel in which the hair actually comes into contact. An example of such an implement is the flat hair curling iron disclosed in United States Patent No. 4,477,716. The hair curling implement disclosed in this U.S. Patent has an outer barrel which is covered with a flocking material which flocking material provides a soft non-damaging surface for contact with the hair. Thus, while sufficient heat is generated for application to the hair, the hair comes into contact with the flocked surface of the barrel instead of the metal itself thereby protecting the hair.

In the development of new hair curling rollers, various constructions have been developed for providing the outer surface of the roller with a soft surface for actual contact with the hair. These hair curling rollers are heated by placing the roller over a heating post which is mounted on a base unit. The heating post is heated through the use of a heating mechanism located either in the base unit or the heating posts. The heating mechanism generates heat which is transferred to the inner core of the roller and radiates out to the outer surface of the roller. Three different types of soft surfaces have been provided in various commercial systems for hair curling rollers. In another embodiment of a hair curling roller the roller has been provided with a sleeve of spongy material covering its outer surface. In a third embodiment of a hair curling roller, the roller has been provided with a sleeve of rubber covering its outer surface.

Over the past several years numerous attempts have been made to make various personal care electric items capable of being operated by rechargeable batteries. However, where heat is generated through the application of an electrical current through a resistance wire, such a heating system draws a relatively high degree of current which causes rapid discharge of the rechargeable battery. Consequently, with the various types of

heating systems commonly used in hair curling irons and hair curling brushes for the application of heat, the heating system is extremely inefficient thereby necessitating a high degree of current to be supplied to the heating system which rapidly drains the charge on the battery and hence prevent the system from being operative for any time period of more than an extremely short duration.

Various types of hair curling irons have been developed through the years. Exemplary of those curling irons are the particular irons disclosed in the following United States Patent Nos.: 1,018,673; 1,284,792; 1,647,748; 1,691,244; 2,254,266; and 3,135,269. U.S. Patent No. 1,078,673 discloses a hair curling iron in which an electrical wire is wrapped in a spiral pattern around an inner tube. An outer metal casing is then placed over the inner tube and the electrical resistance wire with an air gap being left between the wire and the outer metal casing in order to prevent the electrical current from being in contact with the metal casing so as to avoid having an electrical charge on the outer metal casing that contacts the hair of the user. U.S. Patent No. 1,284,792 discloses the use of a crimping casing which slides over and is detachably coupled to an inner casing which has the electrical heating member arranged inside of it. U.S. Patent No. 1,647,748 discloses a heating system in which an electrical wire is wrapped in a criss-cross pattern around an inner tube with an outer tube then being arranged over the electrical wire. U.S. Patent No. 1,691,244 discloses a hair curling iron in which the tubular casing is covered with a fabric covering and a heating coil is arranged inside of the casing. U.S. Patent No. 2,254,266 discloses a hair curling iron having a detachable outer sleeve that is slid over an inner tube which contains the heating element; the outer tube is provided with a plurality of tiny holes of capillary size for passages through which steam or moist vapours can penetrate for use in the curling operation. U.S. Patent No. 2,394,973 discloses a curling iron in which a resistance wire is wrapped within a series of spiral grooves along an inner tube formed of a porcelain member and an outer casing is then positioned around but spaced from this inner tube with the electrical resistance wire. U.S. Patent No. 3,135,269 discloses a curling iron that has a detachable curling tube.

An object of the present invention is to provide an improved heated hair curling implement.

Another object of the present invention is to provide a hair curling implement having a high efficiency heating system that enables the implement to be heated by an electrical resistance member that is supplied with current through a rechargeable battery circuit.

According to the invention, a hair curling apparatus comprises an elongated tubular member around which hair of a user can be wrapped; a handle coupled to said elongated tubular member; heating means for generating heat around said elongated tubular member and including a heating member extending along said elongated tubular member; and a non-conductive material covering said heating member for enabling heat generated

by said heating means to be readily transferred to the hair without said heating element contacting the hair.

Embodiments of the invention will be described by way of example only with reference to the accompanying drawings, in which:

Fig. 1 is a perspective view of a curling iron constructed in accordance with the present invention;

Fig. 2 is a side-elevational side view of the elongated tubular end of the curling iron shown in Fig. 1 with a portion of the iron being cut away;

Fig. 3 is a cross-sectional view of the elongated tubular member of the curling iron shown in Fig. 1;

Fig. 4 is an end view of the elongated tubular member from that end of such member which is coupled to the handle of the curling iron shown in Fig. 1.

Fig. 5 is an end perspective view of the handle of the curling iron shown in Fig. 1 from the end of such handle which is coupled to the elongated tubular member.

Fig. 6 is an elongated tubular member in accordance with the present invention with the tubular member having a plurality of brush members.

Fig. 7 is a side-elevational view similar to Fig. 2 of a modified embodiment of the curling iron section shown in Fig. 2.

Fig. 8 is a simplified schematic circuit diagram showing the application of the supply of DC current to the resistance heater wire.

Figs. 9 and 10 are schematic circuit diagrams of two different embodiments of a power supply and rechargeable battery circuit for use in the present invention.

Referring to the drawings, a curling iron 2 has a handle 4, an elongated heated tube 6 and a clamp member 8 for grasping hair. The clamp member 8 is pivotally attached to the elongated tube 6 by a screw connection 12. The clamp member 8 has a clamp lever 10 which is spring-biased by a spring 24 for pressing the clamp member 8 against the elongated tube 6. A switch 14 is provided for turning the curling iron on and off.

Wrapped around the elongated tubular member 6 is a flat resistance heating wire 16. The wire 16 is wrapped in a spiral pattern around the elongated tubular member. A non-conductive sleeve 18, which preferably is formed of a silicone rubber material, is positioned over and in contact with the flat resistance wire. This rubber sleeve allows heat to be radiated from the flat resistance wire to the hair of the user while electrically insulating the hair from the current within the flat resistance element.

This rubber sleeve 18 need not extend over the end 38 of the elongated member. The end 38 of the elongated member, however, should be formed of an electrically non-conductive material. Similarly the internal core member 39 of the elongated tubular member 6 is formed of an electrically non-conductive material. In actual construction, the inner tube 39 and the end 38 can be a unitary piece over which the flat resistance element 16 is wrapped and over which the rubber sleeve 18 then is placed.

Alternatively, the inner core 39 and the end member 38 can be separate members such as shown in Fig. 3.

A silicone rubber sleeve also can be slid over the end of the clamp 8 so as to cover the inner and the outer surfaces, 22 and 20, respectively, of the clamp. Such a rubber sleeve on the clamp helps to further protect the hair from any damage by the metal surface of the clamp.

As shown in Fig. 3, the flat resistance wire is wrapped in a spiral pattern around the inner core 39 of the elongated tubular member 6. The ends of the flat resistance wire 16 are connected to two electrical connecting pins 28 and 30 by wires 29 and 31. The wire 29 extends through the interior 33 of the inner core member 39 from the far end of the elongated tubular member 6 back to the pin 28. The rubber sleeve 18 is then arranged around and in contact with the flat resistance wire 16 and the inner core member 39.

The pins 28 and 30 protrude from an end surface within the coupling member 26 as shown in Figs. 3 and 4. The coupling member 26 is coupled to an end 32 of the handle 4 for mounting the clamp member onto the handle 4. When the coupling member 26 is attached to the end 32, which can use any standard type of locking mechanism for such coupling operation, the pins 28 and 30 enter into mating electrical connectors 34 and 36. In this manner, the flat resistance wire 16 is coupled to an electrical supply circuit which is arranged within the handle 4.

In a second embodiment of the present invention instead of having a clamp structure such as shown in Figs. 1 and 2, the elongated tubular member can include a plurality of brush members such as shown in Fig. 6 so as to form a heated curling brush 40. In the heated curling brush 40, each of the brush members has a plurality of teeth 42 extending in a radial direction out from the surface of the elongated section of the brush member. Wrapped around the inner core 47 of the brush member 40 is a flat resistance heater wire 46. This flat resistance heater wire is similar to the wire 16 described above and would be connected to a pair of end connector pins which can be coupled to mating connectors within the handle of the curling implement. Arranged around the flat resistance heating wire 46 and the inner core 47 is a rubber sleeve member 48. The curling brush member 40 can be connected to the handle 4 by a coupling member 44.

Instead of using a rubber sleeve as a covering over the tubular member of the curling iron and curling brush as well as the clamp member that are discussed above, the surfaces of the tubular members as well as the clamp can be coated with a silicone rubber material. As shown in Fig. 7, a coating of silicone rubber 50 is coated over the exterior of the flat resistance heating element 16 and the inner core member 39 of the curling iron. Similarly the inner surface 52 and the outer surface 54 of the clamp member are coated with a silicone rubber material. In the same manner, the curling brush member 6 shown in Fig. 6 can be coated with a silicone rubber material instead of using a rubber sleeve.

As shown in Fig. 8, the resistance wire 16 is provided with an electrical current by the use of a DC voltage supply of between 2.4—3V. The current for the flat resistance element can be supplied by a rechargeable battery circuit such as either of the circuits shown in Fig. 9 and Fig. 10. These circuits would be arranged inside the handle 4.

This heating system is highly efficient and enables a high degree of heat to be generated next to the outer surface of the hair curling implement with a minimum amount of electrical current. Preferably the heating system generates sufficient heat for creating a temperature of approximately 150°C on the outer surface of the hair curling implement.

The provision of the rubber sleeve 18 around the outer surface of the elongated tubular member 6 so that the sleeve is positioned over and in contact with the heating element serves both to protect the hair of the user from the electrical current within the heating element as well as to provide a soft surface against which the hair comes into contact. Such a soft surface is less damaging to the hair than the metal barrel commonly used in most hair curling irons and hair curling brushes. In addition, the rubber sleeve is easier to clean for removing various curling solutions that come into contact with the curling implement during use. Furthermore, the rubber sleeve protects the inner workings of the curling implement against the curling solution which can potentially damage and corrode the heating element. This rubber sleeve also can be a replaceable sleeve so that if it is damaged it can be easily and readily replaced by a new sleeve.

While in accordance with the preferred embodiment of the present invention, a silicone rubber sleeve is utilized for covering the elongated tubular member and the spiral flat resistance heating wire 16 that is wrapped around the tubular member, it is possible to use a sleeve formed from another type of non-conductive sleeve, *i.e.* a sleeve formed of a material that is not electrically conductive.

The tubular member 6 being detachable from the handle 4 enables several different size curling irons and/or curling brushes to be used with a single handle, the detachable coupling member 26 provided on the ends of the tubular member and the handle making it possible to attach the tubular member to the handle.

#### CLAIMS

1. A hair curling apparatus comprising:  
an elongated tubular member around which hair of a user can be wrapped;  
a handle coupled to said elongated tubular member;  
heating means for generating heat around said tubular member and including a heating member extending along said elongated tubular member; and  
a non-conductive material covering said heating member for enabling heat generated by said heating means to be readily transferred to the hair

without said heating element contacting the hair.

2. A hair curling apparatus as claimed in claim 1 in which the heating means includes a flat resistance heating element wrapped in a spiral pattern around the elongated tubular member.

3. A hair curling apparatus according to claim 1 wherein the non-conductive material is a sleeve.

4. A hair curling apparatus according to claim 1 wherein said elongated tubular member is formed of a non-conductive material.

5. A hair curling apparatus according to claim 1 or 3 wherein said non-conductive material is formed of a silicone rubber.

6. A hair curling apparatus according to claim 4 wherein said elongated tubular member is formed of a plastics material.

7. A hair curling apparatus according to claim 1 further comprising coupling means for detachably coupling said handle to said elongated tubular member.

8. A hair curling apparatus according to claims 2 and 7 wherein said heating means further includes two electrical connectors to which the ends of said flat resistance heating element are coupled and said handle includes two mating electrical connectors for coupling with said electrical connectors of said heating means and all of said electrical connectors are constructed such that said elongated tubular member is readily detachable from said handle.

9. A hair curling apparatus according to claim 1 further comprising clamp means including a clamp member and mounting means for mounting said clamp so that it is pivotable with respect to said elongated tubular member in order that said clamp member can grasp hair between said clamp member and said non-conductive sleeve positioned around said elongated tubular member.

10. A hair curling apparatus according to claim 9, wherein said clamp has at least its outer surface covered with a non-conductive material.

11. A hair curling apparatus according to claim 1 further comprising a plurality of brush members each brush member having a plurality of teeth and being arranged around said elongated tubular member with said teeth projecting through said non-conductive sleeve in a radial direction away from said elongated tubular member.

12. A hair curling apparatus according to claim 1 further comprising power generating means for supplying electrical current to said heating means, said power generating means including a rechargeable battery for supplying current to said heating means, and means for enabling said battery to be recharged by a supply of A.C. current.

13. A hair curling apparatus according to claim 9 wherein said clamp has at least its outer surface covered with a non-conductive material.

14. A hair curling apparatus according to claim 9 wherein said clamp has at least its inner surface covered with a non-conductive material.

15. A hair curling apparatus according to claim 9 where said clamp has a sleeve of rubber material covering its inner and outer surfaces.

16. A hair curling apparatus substantially as  
herein described and as illustrated by Figs. 1 to 6, or

Fig. 7, and Figs. 8 and 9 or Figs. 1 to 6, or Fig. 7, and  
Figs. 8 and 10 of the accompanying drawings.

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